

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Cancelled).
2. (Currently Amended) ~~The method of manufacturing the piezoelectric/electrostrictive film device according to claim 1;~~ A method of manufacturing a piezoelectric/electrostrictive film device comprising a ceramic substrate and a piezoelectric/electrostrictive operation portion formed on said ceramic substrate, said piezoelectric/electrostrictive operation portion including a lower electrode, a piezoelectric/electrostrictive layer, and an upper electrode, wherein said piezoelectric/electrostrictive layer is formed to extend beyond ends of at least one of said electrodes so that ends of a projected portion of said piezoelectric/electrostrictive layer project beyond said ends of said at least one electrode, said method comprising the steps of:
forming said piezoelectric/electrostrictive layer of said piezoelectric/electrostrictive operation portion so that ends of said projected portion of said piezoelectric/electrostrictive layer project beyond ends of at least one of said electrodes;
preparing a coating liquid by admixing a polymerizable oligomer and inorganic particles in a dispersing medium in a sufficient amount to allow said coating liquid to permeate through a gap between at least said projecting portion of said piezoelectric/electrostrictive layer and said ceramic substrate;
~~wherein, said applying step comprises applying said coating liquid to said one~~ or more discrete application portions of said at least one electrode using a coating apparatus comprising:
pressurizing supply means for pressurizing/supplying said coating liquid;

switching means disposed in a supply path of said pressurizing supply means to switch a supply of said coating liquid; and
a discharge head for discharging said coating liquid introduced from said supply path of said pressurizing supply means to the outside, said discharge head comprising

a discharge head substrate including a coating liquid introduction path connected to said supply path of said pressurizing supply means,

a pressurizing chamber in which said coating liquid introduction path opens,

one or more coating liquid discharge paths connected to said pressurizing chamber and opened to the outside, and

a piezoelectric/electrostrictive operation portion disposed in a position opposing said pressurizing chamber on said discharge head substrate;

wherein said coating liquid introduced into said pressurizing chamber is continuously discharged in an atomized droplet state by a flexural displacement of said piezoelectric/electrostrictive operation portion when said switching means is open; and
drying said coating liquid to form a coupling member which couples said ends of said projected portion of said piezoelectric/electrostrictive layer to said ceramic substrate.

3. (Currently Amended) ~~The method of manufacturing the piezoelectric/electrostrictive film device according to claim 1, wherein~~ A method of manufacturing a piezoelectric/electrostrictive film device comprising a ceramic substrate and a piezoelectric/electrostrictive operation portion formed on said ceramic substrate, said piezoelectric/electrostrictive operation portion including a lower electrode, a piezoelectric/electrostrictive layer, and an upper electrode, wherein said piezoelectric/electrostrictive layer is formed to extend beyond ends of at least one of said electrodes so that ends of a projected portion of said piezoelectric/electrostrictive

layer project beyond said ends of said at least one electrode, said method comprising the steps of:

..... forming said piezoelectric/electrostrictive layer of said piezoelectric/electrostrictive operation portion so that ends of said projected portion of said piezoelectric/electrostrictive layer project beyond ends of at least one of said electrodes;

..... preparing a coating liquid by admixing a polymerizable oligomer and inorganic particles in a dispersing medium in a sufficient amount to allow said coating liquid to permeate through a gap between at least said projecting portion of said piezoelectric/electrostrictive layer and said ceramic substrate;

..... ~~said applying step comprises~~ applying said coating liquid to said one or more discrete application portions of said at least one electrode using a coating apparatus comprising:

a substrate including a coating liquid introduction path connected to a coating liquid supply source, a pressurizing chamber in which said coating liquid introduction path is opened, and one or more coating liquid discharge paths connected to said pressurizing chamber and opened to the outside; and

a piezoelectric/electrostrictive operation portion disposed in a position opposing said pressurizing chamber;

wherein said coating liquid introduced into said pressurizing chamber is discharged in an atomized droplet state in accordance with a flexural

displacement of said piezoelectric/electrostrictive operation portion; and

..... drying said coating liquid to form a coupling member which couples said ends of said projected portion of said piezoelectric/electrostrictive layer to said ceramic substrate.

4. (Currently Amended) The method of manufacturing the piezoelectric/ electrostrictive film device according to claim 2, wherein said applying step comprises applying said coating liquid to a plurality of said one or more discrete application portions of said at least one electrode in different amounts at different ones of a said plurality of said discrete application portions using one of (1) a coating apparatus comprising a discharge head including a plurality of coating liquid discharge paths having different nozzle sizes, and (2) a coating apparatus comprising a plurality of discharge heads different from one another in the nozzle size of the coating liquid discharge path.

5. (Currently Amended) The method of manufacturing the piezoelectric/ electrostrictive film device according to claim 3, wherein said applying step comprises applying said coating liquid to a plurality of said one or more discrete application portions of said at least one electrode in different amounts at different ones of a said plurality of said discrete application portions using a coating apparatus comprising a plurality of coating liquid discharge paths having different nozzle sizes.

6. (Currently Amended) The method of manufacturing the piezoelectric/ electrostrictive film device according to claim ~~12~~, wherein said applying step comprises vibrating at least one of said substrate and said piezoelectric/electrostrictive layer during said applying step.

7. (Cancelled).

8. (Currently Amended) ~~The method of manufacturing the piezoelectric/electrostrictive film device according to claim 7, wherein~~ A method of manufacturing a piezoelectric/electrostrictive film device comprising a ceramic substrate and a piezoelectric/electrostrictive operation portion formed on said ceramic substrate, said piezoelectric/electrostrictive operation portion comprising a

multilayered structure including a plurality of lower electrodes, a plurality of piezoelectric/electrostrictive layers, and a plurality of upper electrodes alternately stacked on said substrate so that ends of a projected portion of said piezoelectric/electrostrictive layers project beyond ends of at least one of said electrodes, said method comprising the steps of:

..... forming said piezoelectric/electrostrictive layers of said piezoelectric/electrostrictive operation portion so that ends of said projected portion of said piezoelectric/electrostrictive layers project beyond ends of at least one of said electrodes;

..... preparing a coating liquid by admixing a polymerizable oligomer and inorganic particles in a dispersing medium in a sufficient amount to allow said coating liquid to permeate through a gap between at least said projecting portion of said piezoelectric/electrostrictive layers and said ceramic substrate;

..... said applying step comprises applying said coating liquid to said one or more discrete application portions of said at least one electrode using a coating apparatus comprising:

pressurizing supply means for pressurizing/supplying said coating liquid;

switching means disposed in a supply path of said pressurizing supply means to switch a supply of said coating liquid; and

a discharge head for discharging said coating liquid introduced from the supply path of the pressurizing supply means to the outside, said discharge head comprising

a discharge head substrate including a coating liquid introduction path connected to said supply path of said pressurizing supply means,

a pressurizing chamber in which said coating liquid introduction path opens,

one or more coating liquid discharge paths connected to said pressurizing chamber and opened to the outside, and

a piezoelectric/electrostrictive operation portion disposed in a position opposing said pressurizing chamber on said discharge head substrate;

wherein said coating liquid introduced into said pressurizing chamber is continuously discharged in an atomized droplet state by a flexural displacement of said piezoelectric/electrostrictive operation portion when said switching means is open; and

drying said coating liquid to form a coupling member which couples said ends of said projected portion of said piezoelectric/electrostrictive layers to said ceramic substrate.

9. (Currently Amended) ~~The method of manufacturing the piezoelectric/electrostrictive film device according to claim 7, wherein~~ A method of manufacturing a piezoelectric/electrostrictive film device comprising a ceramic substrate and a piezoelectric/electrostrictive operation portion formed on said ceramic substrate, said piezoelectric/electrostrictive operation portion comprising a multilayered structure including a plurality of lower electrodes, a plurality of piezoelectric/electrostrictive layers, and a plurality of upper electrodes alternately stacked on said substrate so that ends of a projected portion of said piezoelectric/electrostrictive layers project beyond ends of at least one of said electrodes, said method comprising the steps of:

forming said piezoelectric/electrostrictive layers of said piezoelectric/electrostrictive operation portion so that ends of said projected portion of said piezoelectric/electrostrictive layers project beyond ends of at least one of said electrodes;

preparing a coating liquid by admixing a polymerizable oligomer and inorganic particles in a dispersing medium in a sufficient amount to allow said coating liquid to

permeate through a gap between at least said projecting portion of said piezoelectric/electrostrictive layers and said ceramic substrate;

said applying step comprises applying said coating liquid to said one or more discrete application portions of said at least one electrode using a coating apparatus comprising:

a substrate including a coating liquid introduction path connected to a coating liquid supply source, a pressurizing chamber in which said coating liquid introduction path is opened, and one or more coating liquid discharge paths connected to said pressurizing chamber and opened to the outside; and

a piezoelectric/electrostrictive operation portion disposed in a position opposing said pressurizing chamber;

wherein said coating liquid introduced into said pressurizing chamber is discharged in an atomized droplet state in accordance with a flexural displacement of said piezoelectric/electrostrictive operation portion; and drying said coating liquid to form a coupling member which couples said ends of said projected portion of said piezoelectric/electrostrictive layers to said ceramic substrate.

10. (Currently Amended) The method of manufacturing the piezoelectric/electrostrictive film device according to claim 8, wherein said applying step comprises applying said coating liquid to a plurality of said one or more discrete application portions of said at least one electrode in different amounts at different ones of a said plurality of said discrete application portions using one of (1) a coating apparatus comprising a discharge head including a plurality of coating liquid discharge paths having different nozzle sizes, and (2) a coating apparatus comprising a plurality of discharge heads different from one another in the nozzle size of the coating liquid discharge path.

11. (Currently Amended) The method of manufacturing the piezoelectric/ electrostrictive film device according to claim 9, wherein said applying step comprises applying said coating liquid to a plurality of said one or more discrete application portions of said at least one electrode in different amounts at different ones of a said plurality of said discrete application portions using a coating apparatus comprising a plurality of coating liquid discharge paths having different nozzle sizes.

12. (Currently Amended) The method of manufacturing the piezoelectric/ electrostrictive film device according to claim ~~7~~8, wherein said applying step comprises vibrating at least one of said substrate and said piezoelectric/electrostrictive ~~layer~~ layers while said coating liquid is applied.

13. (New) The method of manufacturing the piezoelectric/electrostrictive film device according to claim 3, wherein said applying step comprises vibrating at least one of said substrate and said piezoelectric/electrostrictive layer during said applying step.

14. (New) The method of manufacturing the piezoelectric/electrostrictive film device according to claim 9, wherein said applying step comprises vibrating at least one of said substrate and said piezoelectric/electrostrictive layers while said coating liquid is applied.